UNITED STATES PATENT AND TRADEMARK OFFICE

Ex. Kent Wu Chang — Art Unit: 3619

Re:	Application of:	David S. Breed
	Serial No.:	09/645,709
	Confirmation No.:	3330
	Filed:	August 24, 2000
	For:	INTERACTIVE VEHICLE DISPLAY SYSTEM
	Customer Number:	22846

APPEAL BRIEF UNDER 37 C.F.R. §41.37

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

May 10, 2006

Dear Sir:

On May 8, 2006, appellant, through his attorney, appealed from the final rejections of claims 1-6, 8-17, 21, 22, 27-30, 51, 54-62, 64-66, 89, 91, 92 and 94-113 set forth in an Office Action dated March 22, 2006 for the above-referenced application. This Appeal Brief is being timely submitted within two months from the date of the Notice of Appeal in support of the patentability of claims 1-6, 8-17, 21, 22, 27-30, 51, 54-62, 64-66, 89, 91, 92 and 94-113 of this application. For the reasons set forth below, it is believed that the rejections in the Office Action dated March 22, 2006 should be reversed.

A. REAL PARTY IN INTEREST

The real party in interest of the above-identified application is Automotive Technologies International, Inc., by virtue of an assignment of 100% interest in the application by the inventor-appellant.

B. RELATED APPEALS AND INTERFERENCES.

At this time, there are no related appeals or interferences.

C. STATUS OF CLAIMS

Claims 1-6, 8-17, 21, 22, 27-30, 51, 54-62, 64-66, 89, 91, 92 and 94-113 are pending in this application and all have been rejected. Claims 7, 18, 31, 35-50, 52, 53, 63, 67-88, 90 and 93 are cancelled. Claims 19, 20, 23-26 and 32-34 are withdrawn from consideration in view of an election of species requirement.

Claim 1 is an independent claim upon which claims 2-6, 8-17, 19-22 and 27-30 depend directly or indirectly, claim 51 is a second independent claim upon which claims 54-62 and 64-66 depend directly or indirectly and claim 89 is a third independent claim upon which claims 91, 92, 94-113 depend directly or indirectly. The text of the claims on appeal is found in the Claims Appendix.

D. STATUS OF AMENDMENTS

An Amendment Under 37 C.F.R. §1.116 was filed on October 12, 2004 in response to a (first) Final Office Action mailed July 9, 2004. In an Advisory Action mailed December 2, 2004, the Examiner indicated that the Amendment would be entered for the purposes of Appeal. An Appeal Brief was filed February 11, 2005. A second Final Office Action was mailed March 22, 2006 re-opening prosecution. No Amendment was filed subsequent to this second Final Office Action.

E. SUMMARY OF THE INVENTION

The present invention as defined in claim 1 relates to a vehicle including an interactive display system for a vehicle having "forming means" for forming an image of text and/or graphics in a field of view of a forward-facing occupant of the vehicle and "interacting means", including a touch pad, coupled to the forming means for enabling the occupant to interact with the forming means to change the image

(133 in Figs. 3A-3G) formed by the forming means and/or direct another vehicular system to perform an operation. The forming means form the image apart from the touch pad, e.g., the touch pad is arranged on the steering wheel (103) and the image is projected onto the windshield (135) by the heads-up display (130). The vehicle also includes "correlation means" for correlating a location on the touch pad which has been touched by the occupant to the image to enable the occupant to direct the another vehicular system to perform an operation by touching the touch pad. The correlation means are coupled to the forming means and arranged to cause the forming means to display an indicator in the image which correlates to the location on the touch pad touched by the occupant (for example, a cursor, see the specification, e.g., at page 16, line 28 to page 17, line 6).

An advantage of displaying an indicator of the touched location on the formed image (as shown in Figs. 3B, 3C, 3E and 3F) is that the occupant can see what operation will occur when they subsequently press their finger against the touch pad. That is, the initial touch of the touch pad will show the occupant where the finger is located in the image, e.g., over a control to adjust the heating system, and the subsequent pressing against the touch pad will execute the function being displayed at the location in the image correlating to the touched location, e.g., adjustment of the heating system. In addition to a cursor, display of an indicator may also encompass a variation in the location in the image correlating to the touched location of the touch pad, e.g., an inversion of the text at that location.

With the display device in accordance with the invention, the driver of a vehicle does not have to look at the touch pad, which may not be in the field of view of the driver when driving the vehicle, and can view the image being formed by the forming means entirely in his or her field of view when driving the vehicle. The driver thus does not have to take his or her eyes off the road in order to perform vehicle control functions.

Appellant hereby identifies "means plus function" as permitted by 35 U.S.C. §112, sixth paragraph, in claim 1 and sets forth structure, material, or acts described in the specification

corresponding to each claimed function with reference to the drawings. Equivalents of the described structure, material or acts are also encompassed within the scope of the claims.

The "forming means" include but are not limited to one or more heads-up displays (heads-up display 130 in Fig. 1) each having a lens system 131 and a holographic combiner or screen 132 (page 24, lines 20-23, Fig. 3A), with the holographic combiner or screen 132 being arranged in front of any forward-facing occupant, and a light source 200, a crystal 210, ultrasonic material 215, lens 220, crystal 230, lens 240 and holographic and collimating material 132 in a windshield 135 (Page 30, line 24 to page 31, line 5, Fig. 4). The forming means also include heads up display systems described in prior art patents (page 31, lines 24-25). The forming means also may include a microphone 115 (page 23, lines 24-30 and Fig. 1; page 25, lines 2-6; page 39, lines 3-8 and Fig. 14).

The "interacting means" include but are not limited to a touch pad 162, 200, 610, 620 arranged, e.g., on a steering wheel 160, armrest or tray (page 24, lines 3-4 and Fig. 2; page 32, lines 7 to page 24, line 18 and Figs. 5-11B).

The "correlating means" include but are not limited to a processor and associated electrical architecture also described as a control module 170 (page 24, line 33 to page 25, line 2), microprocessor 180 and various electronic circuit components 172, 174, 176, 178 (page 19, lines 9-13; page 23, line 31 to page 24, line 4 and Fig. 2). The correlation means may also be resident in a control module 120 which controls the content of the heads up display (page 36, lines 10-12; Fig. 13).

The present invention as defined in claim 51 relates to a vehicle includes forming means, a touch pad and correlation means essentially as described above, as well as determining means for determining a desired location of the eyes of the occupant for optimum viewing of the image (for example, transmitter and/or receiver assemblies 110, 111, 113), and adjustment means coupled to the forming means for adjusting the forming means based on the determined desired location of the eyes of the occupant and thus the location of the image and thereby enable the occupant's view of the image to be improved.

An advantage of this embodiment is that the image projected by the forming means is varied depending on the location of the viewer's eyes to optimize the visualization of the projected text and/or graphics.

Appellant hereby identifies "means plus function" as permitted by 35 U.S.C. §112, sixth paragraph, in claim 51 and sets forth the structure, material, or acts described in the specification corresponding to each claimed function with reference to the drawings. Equivalents of the described structure, material or acts are also encompassed within the scope of the claims.

The "forming means" include but are not limited to one or more heads-up displays (heads-up display 130 in Fig. 1) each having a lens system 131 and a holographic combiner or screen 132 (page 24, lines 20-23, Fig. 3A), with the holographic combiner or screen 132 being arranged in front of any forward-facing occupant, and a light source 200, a crystal 210, ultrasonic material 215, lens 220, crystal 230, lens 240 and holographic and collimating material 132 in a windshield 135 (page 30, line 24 to page 31, line 5, Fig. 4). The forming means also include heads up display systems described in prior art patents (page 31, lines 24-25). The forming means may also include a microphone 115 (page 23, lines 24-30 and Fig. 1; page 25, lines 2-6; page 39, lines 3-8 and Fig. 14).

The "correlating means" include but are not limited to a processor and associated electrical architecture also described as a control module 170 (page 24, line 33 to page 25, line 2), a microprocessor 180 and various electronic circuit components 172, 174, 176, 178 (page 19, lines 9-13; page 23, line 31 to page 24, line 4 and Fig. 2). The correlation means may also be resident in a control module 120 which controls the content of the heads up display (page 36, lines 10-12; Fig. 13).

The "determining means" include but are not limited to the height determining system which determines the height of the occupant from the upper surface of the seat, namely, the headrest 511 and sensor arrangement therein 520, 521, and the table which provides data about the location of the seat to properly position the eyes within the "eye-ellipse" (page 34, line 19 to page 35, line 28; Fig. 12).

The "adjustment means" include but are not limited to an actuator 133, an actuating rod 134 and mounting of the heads-up display assembly 130 to enable its movement, e.g., any of a variety of hinging or pivoting mechanisms (page 36, lines 5-13; Fig. 13).

The present invention as defined in claim 89 relates to a vehicle including forming means which comprise two heads up displays (140, 145, see Fig. 2), one arranged to project text and/or graphics into a field of view of a driver of the vehicle and the other arranged to project text and/or graphics into a field of view of a passenger of the vehicle, as well as a touch pad (162) enabling correlation of a location thereon which has been touched by the occupant to the image to enable each occupant to change the image formed by the heads up displays (140, 145) or direct the another vehicular system to perform an operation by touching the touch pad (162).

As described in the specification at page 23, line 31 to page 24, line 16, each heads up display includes a HUD projection unit (or combiner as understood by those skilled in the art), a touch pad and a wire connecting the touch pad to the projection unit. The recitation of a heads up display therefore inherently connotes the presence of two HUD projection units. The HUD projection units are not shown while only the touch pad (162) and wire (163) for the driver's heads up display (140) are shown in Fig. 2).

Appellant hereby identifies "means plus function" as permitted by 35 U.S.C. §112, sixth paragraph, in claim 89 and sets forth the structure, material, or acts described in the specification corresponding to each claimed function with reference to the drawings. Equivalents of the described structure, material or acts are also encompassed within the scope of the claims.

The "forming means" include but are not limited to a pair of heads-up displays, one for the driver of the vehicle including a screen 140 and one for a passenger of the vehicle including a screen 145. Each heads-up display also includes a lens system 131 (page 24, lines 20-23, Fig. 3A) or a light source 200, a crystal 210, ultrasonic material 215, lens 220, crystal 230, lens 240 and holographic and collimating material 132 in a windshield 135 (page 30, line 24 to page 31, line 5, Fig. 4). The forming means also

include a pair of heads up display systems each of which may be described in prior art patents (page 31, lines 24-25). The forming means may also include a microphone 115 (page 23, lines 24-30 and Fig. 1; page 25, lines 2-6; page 39, lines 3-8 and Fig. 14).

The "interacting means" include but are not limited to a touch pad 162, 200, 610, 620 arranged, e.g., on a steering wheel 160, armrest or tray (page 24, lines 3-4 and Fig. 2; page 32, lines 7 to page 24, line 18 and Figs. 5-11B).

Various dependent claims are separately argued below and contain "means plus function" as permitted by 35 U.S.C. §112, sixth paragraph. Appellant therefore sets forth structure, material, or acts described in the specification corresponding to each claimed function with reference to the drawings. Equivalents of the described structure, material or acts are also encompassed within the scope of the claims.

Claims 14, 59 and 101 include "means for enabling wireless communication between said touch pad and said forming means". These means include but are not limited to wireless technologies using infrared or radio frequency, in which case, the touch pad and forming means, e.g., control module thereof, include a wireless transmission/reception unit known in the art; and the touch pad can also be a passive device that receives its energy to operate from a radio frequency or other power transmission method from an antenna within the automobile or multi-loop cable encircling the vehicle (page 29, line 22 to page 30, line 9).

F. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are:

1. Whether it would have been obvious or even possible for a person having ordinary skill in the art at the time the invention was made to combine purported teachings of Palalau et al. (U.S. Pat. No. 6,373,472), Schiffman (U.S. Pat. No. 5,061,996), Berstis et al. (U.S. Pat. No. 6,505,165), Matsumoto

(U.S. Pat. No. 5,734,357) and/or Matsui (U.S. Pat. No. 6,215,479), and arrive at the embodiments of the invention set forth in claims 89, 91, 92, 94-99 and 104-113.

2. Whether it would have been obvious or even possible for a person having ordinary skill in the art at the time the invention was made to combine purported teachings of Palalau et al., Schiffman and Smith (U.S. Pat. No. 6,195,000) and arrive at the embodiments of the invention set forth in claims 100-103.

3. Whether it would have been obvious or even possible for a person having ordinary skill in the art at the time the invention was made to combine purported teachings of Palalau et al., Matsui, Berstis et al. and Matsumoto and arrive at the embodiments of the invention set forth in claims 1-4, 6, 8-12, 17, 21, 22, 27-30, 51, 54-57, 62 and 64-66.

4. Whether it would have been obvious or even possible for a person having ordinary skill in the art at the time the invention was made to combine purported teachings of Palalau et al., Matsui and Smith and arrive at the embodiments of the invention set forth in claims 13-16 and 58-61.

5. Whether it would have been obvious or even possible for a person having ordinary skill in the art at the time the invention was made to combine purported teachings of Palalau et al., Matsui and Schiffman and arrive at the embodiment of the invention set forth in claim 5.

G. ARGUMENT

Grounds of Rejection 1

Claims 89, 91, 92, 94, 95, 98, 99 and 104-113

Claims 89, 91, 92, 95, 98, 99 and 104-107 are rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Schiffman. Claim 94 is rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Schiffman and Berstis et al. Claims 108-111 are rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Schiffman and

Matsumoto. Claims 112 and 113 are rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Matsui.

The Examiner's rejections are respectfully traversed on the grounds that the cited prior art does not show a vehicle including two heads-up displays, one arranged to project text and/or graphics into a field of view of a driver and the other arranged to project text and/or graphics into a field of view of the passenger.

As admitted by the Examiner (Office Action page 3), Palalau et al. does not disclose two heads up displays.

Schiffman et al. describes a display device 50 which displays images to be presented to a driver and a mirror 54 arranged in the field of view of the driver to reflect the contents of the display device 50 toward the eyes of the driver. A second mirror 55 is arranged in the field of view of the passenger so that the passenger can also view the images being displayed on display device 50. Thus, the Schiffman et al. system includes a single display device and two mirrors 54, 55 both of which reflect the same images from the display device 50.

Schiffman et al. does not disclose, teach or suggest providing two heads up display devices, each inherently including its own projection unit, one for the driver and the other for a passenger to enable them to view different text and/or graphics.

Berstis et al., Matsumoto and Matsui also do not disclose, teach or suggest two heads-up displays.

Since the prior art does not disclose two heads up displays, one skilled in the art could not modify the Palalau et al. system in view of Schiffman, Berstis et al., Matsumoto and/or Matsui and arrive at the embodiment of the invention set forth in claim 89 or the embodiments set forth in claims 91, 92, 94, 95, 98, 99 and 104-113 which depend from claim 89.

Claims 96 and 97

Claims 96 and 97 are rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Schiffman.

The Examiner's rejection is respectfully traversed because Palalau et al. and Schiffman do not disclose, teach or suggest all of the features set forth in these claims, i.e., a touch pad arranged over a cover of an airbag module or being constructed to break upon deployment of an airbag from the airbag module.

The steering wheel shown in Palalau et al. includes portions which are not covered by the touch pad or touch screen 22, 32. Thus, the steering wheel could include an airbag below these portions so that a break in the steering wheel cover could be formed over these portions to enable the airbag to deploy from the steering wheel.

It is therefore not "obvious" to construct the touch pad 22, 32 of Palalau et al. to break upon deployment, since it is not obvious to position the airbag below the touch pad, and in fact, it would not even be considered since it is easier to form a break for airbag deployment in the portions of the steering wheel cover which are not covered by the touch pad 22, 32. Thus, one skilled in the art would be inclined to position the airbag below a portion of the steering wheel cover not apart from the touch pad.

Since the cited prior art does not disclose a touch pad on a steering wheel over a cover and airbag, one skilled in the art could not modify the Palalau et al. system in view of Schiffman in order to arrive at the embodiments of the invention set forth in claims 96 and 97.

Grounds of Rejection 2

Claim 100

Claim 100 is rejected as being unpatentable over Palalau et al., Schiffman and Smith.

The Examiner's rejection is respectfully traversed on the grounds that the cited prior art does not disclose, teach or suggest a touch pad separable from a vehicle and which is used to control a heads up display system in the vehicle.

Palalau et al. and Schiffman do not disclose a touch pad separable from a vehicle.

Smith describes a vehicular emergency visual display system including an electronic display message board 18 and a computer controller 14 having a keypad 19 for inputting a message to be displayed on the display board 18. It is indisputable that controller 14 is not a touch pad.

There are significant differences between a touch pad separable from a vehicle and a keypad which is designed for input only as in Smith. For example, the key pad in Smith does not require the user to view the display board 18 when inputting a message. The user simply enters what they want displayed and it is displayed. By contrast, in the invention, operative use of the touch pad in combination with a heads-up display requires that the user see what is being displayed and the correlation between the location on the touch pad being touched and the display. If the user indiscriminately touches the touch pad without viewing the display, they have no idea what will happen upon touching the touch pad, i.e., how the display will change or how the operation of the vehicle will change. For this reason, touch pads for controlling touch screens are invariably integrated into or fixed in the vehicle in relation to the display to ensure that the user can view the display when using the touch pad.

Smith merely discloses a remote control for a message board, albeit in a vehicle, but has no bearing on the use of a touch pad for controlling a heads-up display or similar device. Smith does not provide any motivation for one skilled in the art to alter the fixing of a touch pad in a vehicle in a desired position relative to the display screen being controlled by the touch pad.

This deficiency of Smith cannot be said to establish the obviousness to one of ordinary skill in the art to provide a detachable touch pad for a vehicle.

Since there is no disclosed teaching or motivation in the prior art to provide a separable touch pad which control a display and inherently requires visualization of the display to enable meaningful use

of the touch pad, one skilled in the art could not modify the Palalau et al. system in view of Schiffman and Smith in order to arrive at the embodiment of the invention set forth in claim 100.

Claim 101

Claim 101 is rejected under 35 U.S.C. §103(a) as being anticipated by Palalau et al., Schiffman and Smith.

Claim 101 is directed to the feature of the touch pad and forming means including means for enabling wireless communication therebetween. This allows the touch pad to be used freely anywhere in the vehicle.

The Examiner's rejection is respectfully traversed on the grounds that the cited prior art does not disclose, teach or suggest a touch pad wirelessly communicating with forming means.

Palalau et al. and Schiffman do not disclose a touch pad communicating wirelessly with a system for forming an image in a field of view of a vehicular occupant.

Smith describes a vehicular emergency visual display system including an electronic display message board 18 and a computer controller 14 having a keypad 19 for inputting a message to be displayed on the display board 18 and which communicates wirelessly with a case 10 containing the message board 18. Controller 14 is not a touch pad.

There are significant differences between a touch pad wirelessly communicating with an image-forming mechanism and a keypad which is designed for input only, as in Smith. For example, the keypad in Smith does not require the user to view the display board 18 when inputting a message. The user simply enters what they want displayed and it is displayed. By contrast, in the invention, operative use of the touch pad in combination with a heads-up display requires that the user see what is being displayed and the correlation between the location on the touch pad being touched and the display. For this reason, touch pads for controlling touch screens are invariably integrated into or fixed in the vehicle using wires to ensure that the touch pad is continually connected to the image-forming mechanism in a position in which the user can view the display when using the touch pad.

Smith's disclosure of a remote control for a message board has no bearing on the use of a touch pad for wirelessly controlling a heads-up display or similar device. Smith does not provide any motivation for one skilled in the art to alter the fixing and wired connection of a touch pad in a vehicle with an image-forming mechanism.

This deficiency of Smith cannot be said to establish the obviousness to one of ordinary skill in the art to wirelessly connect a touch pad and an image-forming mechanism.

Since there is no disclosed teaching or motivation in the prior art to provide a touch pad which wirelessly communicates with an image-forming mechanism, one skilled in the art could not modify the Palalau et al. system in view of Schiffman and Smith in order to arrive at the embodiment of the invention set forth in claim 101.

Claim 102

Claim 102 is rejected under 35 U.S.C. §103(a) as being anticipated by Palalau et al., Schiffman and Smith.

Claim 102 is directed to the feature of the touch pad being arranged in an armrest of the vehicle.

The Examiner's rejection is respectfully traversed on the grounds that the cited prior art does not disclose, teach or suggest a touch pad arranged in an armrest of a vehicle.

Palalau et al. and Schiffman do not disclose a touch pad arranged in the armrest.

Smith shows a movable remote controller 14 for a message board 18. The remote controller 14 is inherently designed to be held by the user and manipulated.

There is absolutely no teaching or suggestion in Smith to arrange the controller 14 in an armrest of a vehicle. Indeed, one skilled in the art would not consider arranging the controller 14 in the armrest because this would fix the position of the controller and the controller 14 is designed to be freely movable whenever the user moves or the user is moved to in an emergency situation. Fixing the controller 14 in the armrest might prevent the user from being able to reach the controller 14 in an accident and would thereby frustrate the purpose of the Smith emergency message notification system.

Therefore, one skilled in the art would not even contemplate arranging the controller of Smith in an armrest of the vehicle.

Since there is no disclosed teaching or motivation in the prior art to arrange a touch pad in an armrest, one skilled in the art could not modify the Palalau et al. system in view of Schiffman and Smith in order to arrive at the embodiment of the invention set forth in claim 102.

Claim 103

Claim 103 is rejected under 35 U.S.C. §103(a) as being anticipated by Palalau et al., Schiffman and Smith.

Claim 103 is directed to the feature of the touch pad being arranged in connection with an instrument panel of the vehicle and movable between a storage position and a use position.

The Examiner's rejection is respectfully traversed on the grounds that the cited prior art does not disclose, teach or suggest a touch pad arranged in connection with the invention and movable between two positions providing selective access thereto.

Palalau et al. and Schiffman do not disclose a touch pad having two positions.

Smith shows a movable remote controller 14 for a message board 18.

In contrast to the claimed embodiment of the invention, the controller in Smith is not arranged in connection with an instrument panel of the vehicle. It is also not expressly described as having a storage position in which it is inaccessible to the user.

There is absolutely no teaching or suggestion in Smith to arrange the controller 14 in connection with the instrument panel. Indeed, one skilled in the art would not consider arranging the controller 14 in connection with the instrument panel, or in connection with any other structure of the vehicle, because this would fix the position of the controller 14 and the controller 14 is designed to be freely movable whenever the user moves or the user is moved to in an emergency situation. Fixing the controller 14 in the armrest might prevent the user from being able to reach the controller 14 in an accident and would thereby frustrate the purpose of the Smith emergency message notification system.

Therefore, one skilled in the art would not even contemplate arranging the controller of Smith in connection with an instrument panel of the vehicle.

Since there is no disclosed teaching or motivation in the prior art to arrange a touch pad in connection with an instrument panel of a vehicle, one skilled in the art could not modify the Palalau et al. system in view of Schiffman and Smith in order to arrive at the embodiment of the invention set forth in claim 103.

Grounds of Rejection 3

Claims 1-4, 6, 8, 11, 12, 17, 21, 22, 27-30, 51, 54, 56, 57, 62 and 64-66

Claims 1-4, 8-12, 17, 21 and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Matsui. Claim 6 is rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Matsui and Berstis et al. Claims 27-30, 51, 54, 56-62 and 64-66 are rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Matsui and Matsumoto.

The Examiner's rejections of claims 1-4, 6, 8, 11, 12, 17, 21, 22, 27-30, 51, 54 and 56-66 are respectfully traversed on the grounds that none of the cited prior art references disclose, teach or suggest correlation means as set forth in independent claims 1 and 51.

The correlation means correlate a location on a touch pad which has been touched by the occupant to the image to enable the occupant to direct another vehicular system to perform an operation by touching the touch pad. The correlation means are coupled to forming means and cause the forming means to display an indicator in the image which correlates to the location on the touch pad touched by the occupant. The touch pad is arranged to enable the occupant to interact with the forming means to direct the vehicular system to perform an operation.

In the invention, touching the touch pad enables the occupant to control a vehicular system in the vehicle. In order to ensure that the occupant changes and controls the specific vehicular system they want to control (and not another adjacent control), an indicator is displayed in the image at a location which

corresponds to the location of the touch by the occupant's finger on the touch pad. Thus, the occupant can visualize a representation of their finger and either continue pressing to control the vehicular system (e.g., exert a higher force to validate the desire to control the indicated function) or move their finger to the "correct" location on the touch pad.

The Examiner relied primarily on Matsui to disclose such correlation means.

Matsui describes an image displaying apparatus which is used for projected presentations and correlates the location on a touch screen panel to a location on an image panel. The touch screen panel is segmented into discrete blocks and the image screen shows a pointer at a block corresponding to the location of the segmented block being touched in the touch screen panel.

In contrast to the invention, Matsui does not disclose, teach or suggest a touch pad which interacts with an image forming device to enable control of vehicular systems. Matsui is designed solely for use in presentations to display a pointer on an image based on the position of a pointing device on a touch screen. There is no mention of any vehicular application or even using the touch on the touch screen panel to perform an operation, in particular one relating to a vehicle.

Palalau et al. does not disclose, teach or suggest correlation means which correlate a location on a touch pad to a location in a projected image to enable touches of the touch pad to control vehicular systems. In Palalau et al. the touch pad itself contains indicia of the function being performed (which requires the driver to view the touch pad) while the projected image shows only the results of the function. As such, Palalau et al. does not provide for any correlation between the touch pad and the projected image.

Moreover, there is no motivation, suggestion or incentive to modify the system of Palalau et al. to provide for correlation between the location on the touch pad being touched and the projected image since the projected image merely displays the results of the touching of an indicated area on the touch pad by the user. That is, each area of the touch pad contains an indicia of what happens when that area is touched (col. 3, lines 61-66) and the image display changes as a result of touching each area. Correlation

between the touched area and the image is not required, i.e., the parameter being changed may be located on the left of the image while the touched area is on the right of the touch screen. Indeed, the touch screen is vertically oriented in an arcuate configuration while the image is rectangular so obviously there is no need for correlation between the location on the touch pad and the projected image. By contrast, in the invention such correlation is needed since indicia on the touch pad may not be present and instead the indicia is contained in the image.

Accordingly, one skilled in the art would not be motivated to modify the system of Palalau et al. to provide for correlation between a touched location on a touch pad and a projected image since there is no need for such correlation in the Palalau et al. system.

Berstis et al., Schiffman et al. and Matsumoto also do not disclose correlation means as set forth in claims 1 and 51.

Since the prior art does not disclose correlation means as set forth in claims 1 and 51 and does not provide any teaching, suggestion or motivation to modify Palalau et al to include such correlation means, one skilled in the art could not modify the Palalau et al. system in view of any of the cited prior art in order to arrive at the embodiments of the invention set forth in independent claims 1 and 51 or the embodiments set forth in claims 2-4, 6, 8, 11, 12, 17, 21, 22, 27-30, 54 and 56-66 dependent therefrom.

Claims 9, 10 and 55

Claims 9 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Matsui. Claim 55 is rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Matsui and Matsumoto.

The Examiner's rejection is respectfully traversed because Palalau et al., Matsui and Matsumoto do not disclose, teach or suggest all of the features set forth in these claims, i.e., a touch pad arranged over a cover of an airbag module or being constructed to break upon deployment of an airbag from the airbag module.

The steering wheel shown in Palalau et al. includes portions which are not covered by the touch pad or touch screen 22, 32. Thus, the steering wheel could include an airbag below these portions so that a break in the steering wheel cover could be formed over these portions to enable the airbag to deploy from the steering wheel.

It is therefore not "obvious" to construct the touch pad 22, 32 of Palalau et al. to break upon deployment, since it is not obvious to position the airbag below the touch pad, and in fact, it would not even be considered since it is easier to form a break for airbag deployment in the portions of the steering wheel cover which are not covered by the touch pad 22, 32. Thus, one skilled in the art would be inclined to position the airbag below a portion of the steering wheel cover not apart from the touch pad.

Since the cited prior art does not disclose a touch pad on a steering wheel over a cover and airbag, one skilled in the art could not modify the Palalau et al. system in view of Matsui or Matsumoto in order to arrive at the embodiments of the invention set forth in claims 9,10 and 55.

Claims 58-61

Claims 58-61 are rejected as being unpatentable over Palalau et al., Matsui and Matsumoto.

The Examiner's rejection is respectfully traversed on the grounds that the cited prior art does not disclose, teach or suggest a touch pad separable from a vehicle and which is used to control a heads up display system in the vehicle (claim 58), a touch pad wirelessly communicating with forming means (claim 59), a touch pad arranged in an armrest of a vehicle (claim 60) or a touch pad arranged in connection with an instrument panel of the vehicle and movable between a storage position and a use position (claim 61).

The admitted that Palalau et al. does not disclose a wireless input device separable from the vehicle (office Action at pages 4 and 8). For this reason, Smith was applied in rejections of claims 13-16 and 100-103 but Smith has not been applied in rejections of claims 58-61.

In view of the absence of a disclosure, teaching or suggestion in the prior art cited against the patentability of claims 58-61 of any and all of the features of claims 58-61, it would not have been

obvious to one skilled in the art to modify Palalau et al. in view of Matsui and Matsumoto in order to arrive at the embodiments of the invention set forth in claims 58-61.

Grounds of Rejection 4

Claim 13

Claim 13 is rejected as being unpatentable over Palalau et al., Matsui and Smith.

The Examiner's rejection is respectfully traversed on the grounds that the cited prior art does not disclose, teach or suggest a touch pad separable from a vehicle and which is used to control a heads up display system in the vehicle.

Palalau et al. and Matsui do not disclose a touch pad separable from a vehicle.

As emphasized above, there are significant differences between a touch pad separable from a vehicle and a keypad which is designed for input only as in Smith. For example, the key pad in Smith does not require the user to view the display board 18 when inputting a message. The user simply enters what they want displayed and it is displayed. By contrast, in the invention, operative use of the touch pad in combination with a heads-up display requires that the user see what is being displayed and the correlation between the location on the touch pad being touched and the display. For this reason, touch pads for controlling touch screens are invariably integrated into or fixed in the vehicle in relation to the display to ensure that the user can view the display when using the touch pad.

Smith does not provide any motivation for one skilled in the art to alter the fixing of a touch pad in a vehicle in a desired position relative to the display screen being controlled by the touch pad. This deficiency of Smith cannot be said to establish the obviousness to one of ordinary skill in the art to provide a detachable touch pad for a vehicle.

Since there is no disclosed teaching or motivation in the prior art to provide a separable touch pad which control a display and inherently requires visualization of the display to enable meaningful use

of the touch pad, one skilled in the art could not modify the Palalau et al. system in view of Matsui and Smith in order to arrive at the embodiment of the invention set forth in claim 13.

Claim 14

Claim 14 is rejected under 35 U.S.C. §103(a) as being anticipated by Palalau et al., Matsui and Smith.

Claim 14 is directed to the feature of the touch pad and forming means including means for enabling wireless communication therebetween.

The Examiner's rejection is respectfully traversed on the grounds that the cited prior art does not disclose, teach or suggest a touch pad wirelessly communicating with forming means.

Palalau et al. and Matsui do not disclose a touch pad communicating wirelessly with a system for forming an image in a field of view of a vehicular occupant.

As emphasized above, there are significant differences between a touch pad wirelessly communicating with an image-forming mechanism and a keypad which is designed for input only, as in Smith. For example, the keypad in Smith does not require the user to view the display board 18 when inputting a message. The user simply enters what they want displayed and it is displayed. By contrast, in the invention, operative use of the touch pad in combination with a heads-up display requires that the user see what is being displayed and the correlation between the location on the touch pad being touched and the display. For this reason, touch pads for controlling touch screens are invariably integrated into or fixed in the vehicle using wires to ensure that the touch pad is continually connected to the image-forming mechanism in a position in which the user can view the display when using the touch pad.

Smith's disclosure of a remote control for a message board has no bearing on the use of a touch pad for wirelessly controlling a heads-up display or similar device. Smith does not provide any motivation for one skilled in the art to alter the fixing and wired connection of a touch pad in a vehicle with an image-forming mechanism.

This deficiency of Smith cannot be said to establish the obviousness to one of ordinary skill in the art to wirelessly connect a touch pad and an image-forming mechanism.

Since there is no disclosed teaching or motivation in the prior art to provide a touch pad which wirelessly communicates with an image-forming mechanism, one skilled in the art could not modify the Palalau et al. system in view of Matsui and Smith in order to arrive at the embodiment of the invention set forth in claim 14.

Claim 15

Claim 15 is rejected under 35 U.S.C. §103(a) as being anticipated by Palalau et al., Matsui and Smith.

Claim 15 is directed to the feature of the touch pad being arranged in an armrest of the vehicle.

The Examiner's rejection is respectfully traversed on the grounds that the cited prior art does not disclose, teach or suggest a touch pad arranged in an armrest of a vehicle.

Palalau et al. and Matsui do not disclose a touch pad arranged in the armrest.

Smith shows a movable remote controller 14 for a message board 18. The remote controller 14 is inherently designed to be held by the user and manipulated.

There is absolutely no teaching or suggestion in Smith to arrange the controller 14 in an armrest of a vehicle. Indeed, one skilled in the art would not consider arranging the controller 14 in the armrest because this would fix the position of the controller and the controller 14 is designed to be freely movable whenever the user moves or the user is moved to in an emergency situation. Fixing the controller 14 in the armrest might prevent the user from being able to reach the controller 14 in an accident and would thereby frustrate the purpose of the Smith emergency message notification system.

Therefore, one skilled in the art would not even contemplate arranging the controller of Smith in an armrest of the vehicle.

Since there is no disclosed teaching or motivation in the prior art to arrange a touch pad in an armrest, one skilled in the art could not modify the Palalau et al. system in view of Matsui and Smith in order to arrive at the embodiment of the invention set forth in claim 15.

Claim 16

Claim 16 is rejected under 35 U.S.C. §103(a) as being anticipated by Palalau et al., Matsui and Smith.

Claim 16 is directed to the feature of the touch pad being arranged in connection with an instrument panel of the vehicle and movable between a storage position and a use position.

The Examiner's rejection is respectfully traversed on the grounds that the cited prior art does not disclose, teach or suggest a touch pad arranged in connection with the invention and movable between two positions providing selective access thereto.

Palalau et al. and Matsui do not disclose a touch pad having two positions.

Smith shows a movable remote controller 14 for a message board 18.

In contrast to the claimed embodiment of the invention, the controller in Smith is not arranged in connection with an instrument panel of the vehicle. It is also not expressly described as having a storage position in which it is inaccessible to the user.

There is absolutely no teaching or suggestion in Smith to arrange the controller 14 in connection with the instrument panel. Indeed, one skilled in the art would not consider arranging the controller 14 in connection with the instrument panel, or in connection with any other structure of the vehicle, because this would fix the position of the controller 14 and the controller 14 is designed to be freely movable whenever the user moves or the user is moved to in an emergency situation. Fixing the controller 14 in the armrest might prevent the user from being able to reach the controller 14 in an accident and would thereby frustrate the purpose of the Smith emergency message notification system.

Therefore, one skilled in the art would not even contemplate arranging the controller of Smith in connection with an instrument panel of the vehicle.

Since there is no disclosed teaching or motivation in the prior art to arrange a touch pad in connection with an instrument panel of a vehicle, one skilled in the art could not modify the Palalau et al. system in view of Matsui and Smith in order to arrive at the embodiment of the invention set forth in claim 16.

Grounds of Rejection 5

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Palalau et al. in view of Matsui et al. and Schiffman.

The Examiner's rejection is respectfully traversed on the grounds that the cited prior art does not show a vehicle including two heads-up displays, one arranged to project text and/or graphics into a field of view of a driver and the other arranged to project text and/or graphics into a field of view of the passenger.

Palalau et al. and Matsui et al. do not disclose two heads up displays.

Schiffman et al. describes a display device 50 which displays images to be presented to a driver and a mirror 54 arranged in the field of view of the driver to reflect the contents of the display device 50 toward the eyes of the driver. A second mirror 55 is arranged in the field of view of the passenger so that the passenger can also view the images being displayed on display device 50. Thus, the Schiffman et al. system includes a single display device and two mirrors 54, 55 both of which reflect the same images from the display device 50.

Schiffman et al. does not disclose, teach or suggest providing two heads up display devices, each inherently including its own projection unit, one for the driver and the other for the passenger to enable them to view different text and/or graphics.

Since the cited prior art does not disclose two heads up displays, one skilled in the art could not modify the Palalau et al. system in view of Matsui and Schiffman in order to arrive at the embodiment of the invention set forth in claim 5.

H. CONCLUSION

The prior art cited by the Examiner in the rejections of the pending claims does not disclose important features of the claimed embodiments of the invention and thus cannot be combined to render the claimed embodiments obvious and/or it would not have been obvious to one of ordinary skill in the art to combine the cited prior art in the manner suggested by the Examiner in order to arrive at the claimed embodiments of the invention. For example, the feature of correlating a location on a touch pad to a location in a projected image to enable touches of the touch pad to control vehicular systems (claims 1 and 51) is not disclosed in the cited prior art nor is the feature of two heads up display (claim 89).

Therefore, upon reason and authority, it is respectfully requested that the board reverse all of the final rejections.

The fee of $250.00 for filing an Appeal Brief, appellant having qualified for small entity status, has already been paid.

An early and favorable action on the appeal is earnestly solicited.

FOR THE APPELLANT
Respectfully submitted,

/ Brian Roffe/

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CLAIMS APPENDIX

1. A vehicle including an interactive display system for a vehicle, comprising:

forming means for forming an image of text and/or graphics in a field of view of a forward-facing occupant of the vehicle,

interacting means coupled to said forming means for enabling the occupant to interact with said forming means to direct another vehicular system to perform an operation, said interacting means comprising a touch pad arranged to enable the occupant to interact with said forming means to direct the another vehicular system to perform an operation, said forming means being arranged to form the image apart from said touch pad, and

correlation means for correlating a location on said touch pad which has been touched by the occupant to the image to enable the occupant to change the image formed by said forming means or direct the another vehicular system to perform an operation by touching said touch pad, said correlation means being coupled to said forming means and arranged to cause said forming means to display an indicator in the image which correlates to the location on said touch pad touched by the occupant.

2. The vehicle of claim 1, wherein said forming means comprise a heads-up display.

3. The vehicle of claim 1, wherein said forming means are arranged in connection with an instrument panel of the vehicle.

4. The vehicle of claim 1, wherein said forming means are arranged to form the image on a windshield of the vehicle.

5. The vehicle of claim 1, wherein said forming means comprise two heads up displays, one arranged to project text and/or graphics into a field of view of a driver and the other arranged to project text and/or graphics into a field of view of the passenger.

6. The vehicle of claim 1, wherein said interacting means further comprise a microphone.

8. The vehicle of claim 1, further comprising a steering wheel, said touch pad being arranged on said steering wheel of the vehicle.

9. The vehicle of claim 8, further comprising an airbag module having a cover and being arranged in said steering wheel, said touch pad being arranged over said cover of said airbag module.

10. The vehicle of claim 9, wherein said touch pad is constructed to break upon deployment of said airbag from said airbag module.

11. The vehicle of claim 1, wherein said correlation means are arranged such that contact with said touch pad causes said forming means to change the image based on the location on said touch pad which has been touched by the occupant.

12. The vehicle of claim 1, wherein said correlation means are arranged such that contact with said touch pad causes the vehicular system to perform the operation based on the location on said touch pad which has been touched by the occupant.

13. The vehicle of claim 1, wherein said touch pad is separable from the vehicle.

14. The vehicle of claim 1, wherein said touch pad and said forming means include means for enabling wireless communication between said touch pad and said forming means.

15. The vehicle of claim 1, wherein said touch pad is arranged in an armrest of the vehicle.

16. The vehicle of claim 1, wherein said touch pad is arranged in connection with an instrument panel of the vehicle and is movable between a storage position in which said touch pad is inaccessible to the occupant and a use position in which said touch pad is accessible to the occupant.

17. The vehicle of claim 1, wherein said touch pad is arranged to enable the occupant to interact with said forming means to change the image formed by said forming means.

21. The vehicle of claim 1, wherein the another vehicular system is a heating and air-conditioning system.

22. The vehicle of claim 1, wherein said forming means comprise a holographic combiner arranged in connection with a windshield of the vehicle.

27. The vehicle of claim 1, further comprising

determining means for determining a desired location of the eyes of the occupant, and

adjustment means coupled to said forming means for adjusting said forming means based on the determined desired location of the eyes of the occupant and thus the location of the image and thereby enable the occupant's view of the image to be improved.

28. The vehicle of claim 27, wherein said determining means comprise at least one receiver for receiving waves from a space above a seat in the vehicle in which the occupant is likely to be situated.

29. The vehicle of claim 28, wherein said determining means further comprise pattern recognition means for determining the position of the occupant based on the waves received by said at least one receiver and enable the desired position of the eyes of the occupant to be determined from the position of the occupant.

30. The vehicle of claim 27, wherein said determining means comprise at least one transmitter for transmitting waves into the space above a seat in the vehicle and at least one receiver for receiving the transmitted waves after the waves have passed at least partially through the space above the seat.

51. A vehicle including a display system for a vehicle, comprising

forming means for forming an image of text and/or graphics in a field of view of a forward-facing occupant of the vehicle,

a touch pad coupled to said forming means for enabling the occupant to interact with said forming means to change the image formed by said forming means or direct another vehicular system to perform an operation,

correlation means for correlating a location on said touch pad which has been touched by the occupant to the image to enable the occupant to direct the another vehicular system to perform an operation by touching said touch pad, said correlation means being coupled to said forming means and arranged to cause said forming means to display an indicator in the image which correlates to the location

on said touch pad touched by the occupant, said touch pad being arranged to enable the occupant to interact with said forming means to direct another vehicular system to perform an operation,

determining means for determining a desired location of the eyes of the occupant for optimum viewing of the image, and

adjustment means coupled to said forming means for adjusting said forming means based on the determined desired location of the eyes of the occupant and thus the location of the image and thereby enable the occupant's view of the image to be improved.

54. The vehicle of claim 51, further comprising a steering wheel, said touch pad being arranged on said steering wheel of the vehicle

55. The vehicle of claim 51, further comprising an airbag module having a cover and being arranged in said steering wheel, said touch pad being arranged over said cover of said airbag module and is constructed to break upon deployment of an airbag from the airbag module.

56. The vehicle of claim 51, wherein said correlation means are arranged such that contact with said touch pad causes said forming means to change the image based on the location on said touch pad which has been touched by the occupant.

57. The vehicle of claim 51, wherein said correlation means are arranged such that contact with said touch pad causes the vehicular system to perform the operation based on the location on said touch pad which has been touched by the occupant.

58. The vehicle of claim 51, wherein said touch pad is separable from the vehicle.

59. The vehicle of claim 51, wherein said touch pad and said forming means include means for enabling wireless communication between said touch pad and said forming means.

60. The vehicle of claim 51, wherein said touch pad is arranged in an armrest of the vehicle.

61. The vehicle of claim 51, wherein said touch pad is arranged in connection with an instrument panel of the vehicle and is movable between a storage position in which said touch pad is inaccessible to the occupant and a use position in which said touch pad is accessible to the occupant.

62. The vehicle of claim 51, wherein said touch pad is arranged to enable the occupant to interact with said forming means to change the image formed by said forming means.

64. The vehicle of claim 51, wherein determining means comprise at least one receiver for receiving waves from a space above a seat in the vehicle in which the occupant is likely to be situated.

65. The vehicle of claim 64, wherein said determining means further comprise pattern recognition means for determining the position of the occupant based on the waves received by said at least one receiver and enable the desired position of the eyes of the occupant to be determined from the position of the occupant.

66. The vehicle of claim 51, wherein said determining means comprise at least one transmitter for transmitting waves into the space above a seat in the vehicle and at least one receiver for receiving the transmitted waves after the waves have passed at least partially through the space above the seat.

89. A vehicle including an interactive display system for a vehicle, comprising:

forming means for forming an image of text and/or graphics in a field of view of a forward-facing occupant of the vehicle, said forming means comprising two heads up displays, one arranged to project text and/or graphics into a field of view of a driver of the vehicle and the other arranged to project text and/or graphics into a field of view of a passenger of the vehicle, and

interacting means coupled to said forming means for enabling the occupant to interact with said forming means to change the image formed by said forming means or direct another vehicular system to perform an operation, said interacting means comprising a touch pad,

said forming means being arranged to form the image apart from said touch pad,

wherein a location on said touch pad which has been touched by the occupant is correlated to the image to enable the occupant to change the image formed by said forming means or direct the another vehicular system to perform an operation by touching said touch pad

91. The vehicle of claim 89, wherein said forming means are arranged in connection with an instrument panel of the vehicle.

92. The vehicle of claim 89, wherein said forming means are arranged to form the image on a windshield of the vehicle.

94. The vehicle of claim 89, wherein said interacting means further comprise a microphone.

95. The vehicle of claim 89, further comprising a steering wheel, said touch pad being arranged on said steering wheel of the vehicle.

96. The vehicle of claim 95, further comprising an airbag module having a cover and being arranged in said steering wheel, said touch pad being arranged over said cover of said airbag module.

97. The vehicle of claim 96, wherein said touch pad is constructed to break upon deployment of said airbag from said airbag module.

98. The vehicle of claim 89, further comprising correlation means for correlating a location on said touch pad which has been touched by the occupant to the image and arranged such that contact with said touch pad causes said forming means to change the image based on the location on said touch pad which has been touched by the occupant.

99. The vehicle of claim 89, further comprising correlation means for correlating a location on said touch pad which has been touched by the occupant to the image and arranged such that contact with said touch pad causes the vehicular system to perform the operation based on the location on said touch pad which has been touched by the occupant.

100. The vehicle of claim 89, wherein said touch pad is separable from the vehicle.

101. The vehicle of claim 89, wherein said touch pad and said forming means include means for enabling wireless communication between said touch pad and said forming means.

102. The vehicle of claim 89, wherein said touch pad is arranged in an armrest of the vehicle.

103. The vehicle of claim 89, wherein said touch pad is arranged in connection with an instrument panel of the vehicle and is movable between a storage position in which said touch pad is inaccessible to the occupant and a use position in which said touch pad is accessible to the occupant.

104. The vehicle of claim 89, wherein said touch pad is arranged to enable the occupant to interact with said forming means to change the image formed by said forming means.

105. The vehicle of claim 89, wherein said touch pad is arranged to enable the occupant to interact with said forming means to direct another vehicular system to perform an operation.

106. The vehicle of claim 105, wherein the another vehicular system is a heating and air-conditioning system.

107. The vehicle of claim 89, wherein said forming means comprise a holographic combiner arranged in connection with a windshield of the vehicle.

108. The vehicle of claim 89, further comprising

determining means for determining a desired location of the eyes of the occupant, and

adjustment means coupled to said forming means for adjusting said forming means based on the determined desired location of the eyes of the occupant and thus the location of the image and thereby enable the occupant's view of the image to be improved.

109. The vehicle of claim 108, wherein said determining means comprise at least one receiver for receiving waves from a space above a seat in the vehicle in which the occupant is likely to be situated.

110. The vehicle of claim 109, wherein said determining means further comprise pattern recognition means for determining the position of the occupant based on the waves received by said at least one receiver and enable the desired position of the eyes of the occupant to be determined from the position of the occupant.

111. The vehicle of claim 108, wherein said determining means comprise at least one transmitter for transmitting waves into the space above a seat in the vehicle and at least one receiver for receiving the transmitted waves after the waves have passed at least partially through the space above the seat.

112. The vehicle of claim 89, further comprising correlation means for correlating a location on said touch pad which has been touched by the occupant to the image to enable the occupant to change the image formed by said forming means or direct the another vehicular system to perform an operation by touching said touch pad, said correlation means being coupled to said forming means and arranged to cause said forming means to display an indicator in the image which correlates to the location on said touch pad touched by the occupant.

113. The vehicle of claim 89, wherein said forming means are controlled to display an indicator in the image which correlates to the location on said touch pad touched by the occupant.

RELATED PROCEEDINGS APPENDIX

Not applicable